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Europäisches
Patentamt

Zweigstelle
in Den Haag
Recherchen-
abteilung

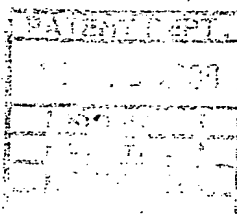
European
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Search
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Office européen
des brevets

Département à
La Haye
Division de la
recherche

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GRANDE BRETAGNE



Datum/Date

08.02.00

Zeichen/Ref./Réf. F.M.O. ERYURLU 2	Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°. 99306931.9-2202-
Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire LUCENT TECHNOLOGIES INC.	

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

☐ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

The following specifications given by the applicant have been approved by the Search Division:

☒ abstract

☐ title

☐ The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract: **1A1B**

REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.



**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 30 6931

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-02-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0454927 A	06-11-1991	US 5001561 A	19-03-1991
		CA 2034418 A	03-11-1991
		FI 912110 A	03-11-1991
		JP 4229791 A	19-08-1992
EP 0577428 A	05-01-1994	JP 6197334 A	15-07-1994
		AU 4160993 A	13-01-1994
		US 5485279 A	16-01-1994
EP 0577363 A	05-01-1994	US 5289548 A	22-02-1994
		CA 2097951 A	31-12-1993
		DE 69320117 D	10-09-1998
		DE 69320117 T	22-04-1999
		JP 6224769 A	12-08-1994
EP 0801506 A	15-10-1997	US 5737451 A	07-04-1998
EP 0863673 A	09-09-1998	US 5974184 A	26-10-1999
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		CA 2230422 A	07-09-1998
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		JP 10304364 A	13-11-1998
		JP 11075191 A	16-03-1999
		JP 11004441 A	06-01-1999
		NO 980948 A	08-09-1998
		NO 980949 A	08-09-1998
		NO 980950 A	08-09-1999



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 454 927 A (AMERICAN TELEPHONE & TELEGRAPH) 6 November 1991 (1991-11-06) * page 2, column 2, line 54 - page 3, column 5, line 9 *	1,5-10	H04N7/26 H04N7/30
A	EP 0 577 428 A (SONY CORP) 5 January 1994 (1994-01-05) * page 12, column 21, line 42 - column 22, line 40 * * page 13, column 24, line 5 - page 14, column 25, line 50 *	1,5-7,9	
A	EP 0 577 363 A (LORAL AEROSPACE CORP) 5 January 1994 (1994-01-05) * page 4, column 5, line 3 - page 5, column 8, line 24 *	1,9	
A	YUUI IZAWA ET AL: "IMPROVEMENT OF PICTURE QUALITY AND CODING EFFICIENCY USING DISCRETE COSINE TRANSFORM" ELECTRONICS & COMMUNICATIONS IN JAPAN, PART I - COMMUNICATIONS,US,SCRIPTA TECHNICA. NEW YORK, vol. 73, no. 6, 1 June 1990 (1990-06-01), pages 12-21, XP000170744 ISSN: 8756-6621 * abstract *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H04N
A	EP 0 801 506 A (EASTMAN KODAK CO) 15 October 1997 (1997-10-15) * abstract *	1	
A	EP 0 863 673 A (GEN INSTRUMENT CORP) 9 September 1998 (1998-09-09) * abstract *	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 February 2000	Examiner Marie-Julie, J-M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE
in its capacity as elected Office

Date of mailing: 08 March 2001 (08.03.01)	
International application No.: PCT/GB00/01842	Applicant's or agent's file reference: F.M.ERYURTLU-2
International filing date: 15 May 2000 (15.05.00)	Priority date: 31 August 1999 (31.08.99)
Applicant: ERYURTLU, Faruk, Mehmet	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International preliminary Examining Authority on:
11 November 2000 (11.11.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer: J. Zahra
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Amended

PATENT COOPERATION TREATY

PCT

REC'D 14 AUG 2001

WIPO

FOI

INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference F.M.ERYURLU-2		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/01842	International filing date (day/month/year) 15/05/2000	Priority date (day/month/year) 31/08/1999	
International Patent Classification (IPC) or national classification and IPC H04N7/26			
Applicant LUCENT TECHNOLOGIES INC			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 11/11/2000	Date of completion of this report 10.08.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer McGrath, S Telephone No. +49 89 2399 8961 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/01842

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

3-7 as originally filed

1,2,2a as received on 30/07/2001 with letter of 26/07/2001

Claims, No.:

1-13 as received on 30/07/2001 with letter of 26/07/2001

Drawings, sheets:

1-5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/01842

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-13
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7,9-11
	No:	Claims	8,12,13
Industrial applicability (IA)	Yes:	Claims	1-13
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Concerning Point V - Reasoned Statement

The following documents, cited in the International Search Report, are mentioned in this report:

- D1: YUUJI IZAWA ET AL: 'IMPROVEMENT OF PICTURE QUALITY AND CODING EFFICIENCY USING DISCRETE COSINE TRANSFORM' ELECTRONICS & COMMUNICATIONS IN JAPAN, PART I - COMMUNICATIONS,US,SCRIPTA TECHNICA. NEW YORK, vol. 73, no. 6, 1 June 1990 (1990-06-01), pages 12-21, XP000170744 ISSN: 8756-6621
- D2: EP-A-0 863 673

1. The subject-matter of claim 8 does not meet the requirements of Article 33(3) and Rule 65(1)(2) PCT since it does not appear to involve an inventive step.

D1 discloses the smoothing along "rows and columns" to obtain interpolated values in a video data coding arrangement.

Then the differences between the received pixel values and the predicted image are transmitted and received.

The only difference between claim 8 and D1 appears to be that in the former the inverse of the difference operation is performed in the time/pixel domain followed by a inverse DCT operation whereas in the latter the processing is all performed in the transform domain and thus clearly doesn't require the inverse DCT step.

For the skilled person it is a matter of routine to choose either the time domain or the transform domain as a matter of convenience.

2. The following dependent claims do not appear to contain any additional features which, in combination with the features of any claim to which they refer, involve an inventive step:

claims 12 & 13 - see D2, page 3, lines 21-22.

3. D1 discloses the smoothing along "rows and columns" to obtain interpolated values in a video data coding arrangement.
Then the differences between the received pixel values and the predicted image are transmitted and received.
However neither D1 nor any other of the available prior art documents discloses the iteration of the prediction values via steps b) and c) as now claimed in the characterizing portion of claim 1.
The subject-matter of claim 1 would therefore appear to meet the requirements of Articles 33(2) and 33(3) PCT.
4. Claims 2-7 contain modifications of the inventive idea embodied in claim 1 and would also appear to meet the requirements of Articles 33(2) and 33(3) PCT.
5. The combination of claim 8 with each of claims 9-11 and would also appear to meet the requirements of Articles 33(2) and 33(3) PCT.

Concerning Point VII - Certain Defects

1. The requirements of Rule 6.3(b) PCT are not met since independent claim 8 is not properly cast in the two part form, according to which those features which in combination are part of the prior art are placed in the preamble.
2. The requirements of Rule 6.2(b) PCT are not met since reference signs are not used in the claims. It is considered that their presence would significantly aid the understanding of the claims especially in the present case due to the complex operation of the embodiment of Fig. 1 for example.

Rec'd PCT/PTO 22 FEB 2002

METHOD AND APPARATUS FOR MACROBLOCK DC AND AC COEFFICIENT PREDICTION FOR VIDEO CODING

This invention relates to apparatus for compressing and expanding video data.

Existing video compression standards are all based on block discrete cosine

5 transform (DCT) transform. The picture is divided into square blocks consisting of 8x8 pixels. The blocks may contain the actual pixels or the prediction residual, which is the difference between the actual and motion compensated block pixels. Each block is transformed into DCT domain, which results in 8x8 coefficients.

The DCT process is used to remove the spatial redundancy between the pixels in
10 the same block. However, it does not consider the redundancy between the pixels from different blocks. The first versions of the standards did not use any technique to exploit the correlation between different blocks. Recently, MPEG-4 and H.263+ have added tools/options to exploit this redundancy to certain extent. At present, MPEG-4 predicts the DC coefficient (first coefficient, which is actually the block average) of the current
15 block by using the DC coefficients of the neighbouring blocks. H.263+ does this, and in addition, it also predicts the first row or column of the DCT coefficients in some cases if there is any benefit.

In brief, existing compression algorithms exploit the fact that the DCT coefficients in the neighbouring blocks are sometimes similar to those in the current block. This
20 means that if the blocks contain completely different coefficients, the prediction will not work.

Against this background, there is provided apparatus for coding video data, comprising means for receiving pixel values organised in frames each comprising a matrix of video blocks, each video block comprising a video matrix of N pixel values, and
25 processor means arranged to perform the following steps:

- a) to set each element in a prediction matrix to an initial prediction value;

b) in the prediction matrix, to apply a smoothing transform to the values along the rows and then along the columns, or vice versa, to obtain interpolated values;

c) to reset the prediction value to the interpolated value;

d) to calculate the difference between the reset prediction values and
5 corresponding received pixel values to produce a residual prediction matrix containing the prediction residuals; and

e) to perform a discrete cosine transform on the prediction residuals to obtain elements of a compressed video data matrix.

The processor means is preferably arranged iteratively to calculate the reset
10 prediction value used to calculate the prediction residual by repeating steps b) and c).

The number of iterations may be predetermined or, in an alternative, the iterations may be repeated until the change in the prediction value between one iteration and the next, is less than a predetermined threshold.

Step a) is most preferably performed by performing a discrete cosine transform on
15 the video matrix to obtain a transform video matrix of N coefficients, selecting n of the coefficients, setting the $N-n$ remaining coefficients to zero to obtain an initial prediction transform matrix of initial prediction coefficients, and performing an inverse discrete cosine transform on the initial prediction transform matrix to obtain a matrix of N initial prediction values.

20 In that case, the processor is preferably arranged to set n of the elements in the compressed video data matrix equal to the n coefficients selected from the transform video matrix, and to select the remaining $N-n$ coefficients from the prediction residuals.

The processor is further preferably arranged to adjust the prediction residuals before selecting the remaining $N - n$ elements, by:

25 f) performing a discrete cosine transform on the reset prediction value matrix to obtain a prediction transform matrix,

CLAIMS

1. Apparatus for coding video data, comprising means for receiving pixel values organised in frames each comprising a matrix of video blocks, each video block comprising a video matrix of N pixel values, and processor means arranged to perform
5 the following steps:
- a) to set each element in a prediction matrix to an initial prediction value;
 - b) in the prediction matrix, to apply a smoothing transform to the values along the rows and then along the columns, or vice versa, to obtain interpolated values;
 - c) to reset the prediction value to the interpolated value;
 - 10 d) to calculate the difference between the reset prediction values and corresponding received pixel values to produce a residual prediction matrix containing the prediction residuals; and
 - e) to perform a discrete cosine transform on the prediction residuals to obtain elements of a compressed video data matrix.
- 15 2. Apparatus as claimed in claim 1, wherein the processor means is arranged iteratively to calculate the reset prediction value used to calculate the prediction residual by repeating steps b) and c).
3. Apparatus as claimed in claim 2, wherein the number of iterations is predetermined.
- 20 4. Apparatus as claimed in claim 2, wherein the processor means is arranged to repeat the iterations until the change in the prediction value between one iteration and the next, is less than a predetermined threshold.
5. Apparatus as claimed in any preceding claim, wherein step a) is performed by performing a discrete cosine transform on the video matrix to obtain a
25 transform video matrix of N coefficients, selecting n of the coefficients, setting the $N-n$ remaining coefficients to zero to obtain an initial prediction transform matrix of initial

prediction coefficients, and performing an inverse discrete cosine transform on the initial prediction transform matrix to obtain a matrix of N initial prediction values.

6. Apparatus as claimed in claim 5, wherein the processor is arranged to set
 n of the elements in the compressed video data matrix equal to the n coefficients
5 selected from the transform video matrix, and to select the remaining $N-n$ coefficients
from the prediction residuals.

7. Apparatus as claimed in claim 6, wherein the processor is arranged to
adjust the prediction residuals before selecting the remaining $N - n$ elements, by:

- f) performing a discrete cosine transform on the reset prediction value
10 matrix to obtain a prediction transform matrix,
- g) selecting n coefficients from the transform prediction matrix,
- h) subtracting the selected n transform prediction matrix coefficients from
the selected n transform video coefficients to obtain n residual coefficients;
- i) setting n elements of an adjustment transform matrix to the values of the
15 n residual coefficients and setting $N - n$ remaining elements to zero;
- j) performing an inverse discrete cosine transform on the adjustment
transform matrix to obtain an adjustment value matrix; and
- k) subtracting the adjustment value matrix from the reset prediction value
matrix.

20 8. Apparatus as claimed in any preceding claim, including means for
processing pixels in a current and a previous frame to produce pixel values which are
the prediction residual between the actual pixel and a motion compensated pixel.

9. Apparatus for expanding video data compressed by apparatus as claimed
in any preceding claim, comprising means for receiving the compressed video matrix,
25 and processor means arranged to perform the following steps:

- a) to perform an inverse discrete cosine transform on received compressed video data to obtain a prediction residual matrix;
- b) to set each element in a prediction block matrix to the initial prediction value;
- 5 c) in the prediction matrix, to apply a smoothing transform to the values along the rows and then along the columns, or vice versa, to obtain interpolated values;
- d) to reset the prediction value to the interpolated value; and
- e) to calculate the sum of the reset prediction values and the prediction residual in corresponding positions in the received coded block matrix to produce an
- 10 expanded video data matrix.

10. Apparatus as claimed in claim 8, wherein the processor means is arranged iteratively to calculate the reset prediction value used to calculate the prediction residual by repeating steps b) and c).

11. Apparatus as claimed in claim 10, wherein the number of iterations is

15 predetermined.

12. Apparatus as claimed in claim 10, wherein the processor means is arranged to repeat the iterations until the change in the prediction value between one iteration and the next, is less than a predetermined threshold.

13. Apparatus as claimed in any of claims 9 to 12, wherein step a) is

20 performed by performing a discrete cosine transform on the video matrix to obtain a transform video matrix of N coefficients, selecting n of the coefficients, setting the $N-n$ remaining coefficients to zero to obtain an initial prediction transform matrix of initial prediction coefficients, and performing an inverse discrete cosine transform on the initial prediction transform matrix to obtain a matrix of N initial prediction values.

25 14. Apparatus as claimed in claim 13 for expanding video data compressed by apparatus as claimed in claim 7, wherein the processor is arranged to select $N - n$

elements from the compressed video data matrix and to set n elements to zero before performing the inverse discrete cosine transform to obtain the prediction residual matrix.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference F.M.ERYURLU-2	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 01842	International filing date (day/month/year) 15/05/2000	(Earliest) Priority Date (day/month/year) 31/08/1999
Applicant LUCENT TECHNOLOGIES INC		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

METHOD AND APPARATUS FOR MACROBLOCK DC AND AC COEFFICIENT PREDICTION FOR VIDEO CODING

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

1



None of the figures.

IPC 7 H04N7/26 H04N7/30

B. FIELDS SEARCHED

IPC 7 H04N

INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

☒ Patent family members are listed in annex.

& document member of the same patent family

Marie-Julie, J-M

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A ✓	YUUI IZAWA ET AL: "IMPROVEMENT OF PICTURE QUALITY AND CODING EFFICIENCY USING DISCRETE COSINE TRANSFORM" ELECTRONICS & COMMUNICATIONS IN JAPAN, PART I - COMMUNICATIONS, US, SCRIPTA TECHNICA. NEW YORK, vol. 73, no. 6, 1 June 1990 (1990-06-01), pages 12-21, XP000170744 ISSN: 8756-6621 abstract ---	1
A ✓	EP 0 801 506 A (EASTMAN KODAK CO) 15 October 1997 (1997-10-15) abstract ---	1
A ✓	EP 0 863 673 A (GEN INSTRUMENT CORP) 9 September 1998 (1998-09-09) abstract -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/01842

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0454927	A	06-11-1991	US 5001561 A	19-03-1991
			CA 2034418 A	03-11-1991
			FI 912110 A	03-11-1991
			JP 4229791 A	19-08-1992
EP 0577428	A	05-01-1994	JP 6197334 A	15-07-1994
			AU 4160993 A	13-01-1994
			US 5485279 A	16-01-1996
EP 0577363	A	05-01-1994	US 5289548 A	22-02-1994
			CA 2097951 A	31-12-1993
			DE 69320117 D	10-09-1998
			DE 69320117 T	22-04-1999
			JP 6224769 A	12-08-1994
EP 0801506	A	15-10-1997	US 5737451 A	07-04-1998
EP 0863673	A	09-09-1998	US 5974184 A	26-10-1999
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			BR 9800852 A	23-11-1999
			BR 9800853 A	03-11-1999
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			CA 2230567 A	07-09-1998
			CN 1198639 A	11-11-1998
			CN 1226781 A	25-08-1999
			EP 0863674 A	09-09-1998
			EP 0863675 A	09-09-1998
			JP 10304364 A	13-11-1998
			JP 11075191 A	16-03-1999
			JP 11004441 A	06-01-1999
			NO 980948 A	08-09-1998
			NO 980949 A	08-09-1998
			NO 980950 A	08-09-1998
			US 6005980 A	21-12-1999
			US 5991447 A	23-11-1999